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ALBERTA NEWSLETTER

INDUSTRIAL DEVELOPMENT BOARD OF THE PROVINCE OF ALBERTA
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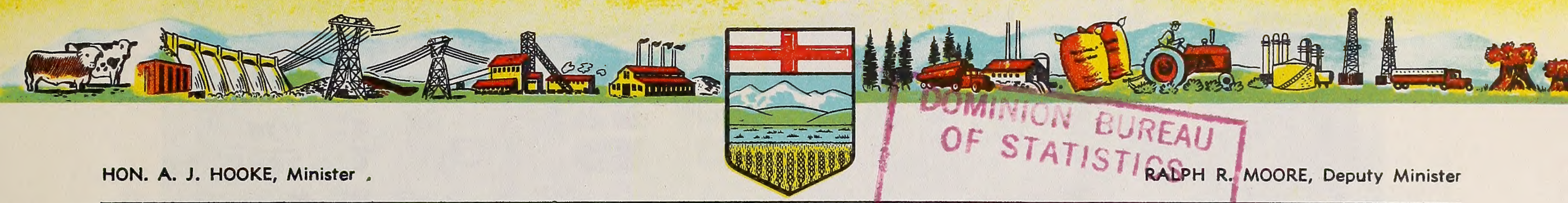

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RALPH R. MOORE, Deputy Minister

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RICHARD MARTLAND, Director
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DOMINION BUREAU OF STATISTICS
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ALBERTA OIL INDUSTRY SETS NEW RECORD DURING 1952

Alberta's oil and natural gas industry continues to expand at a rate that brings Canada closer to the day of self-sufficiency, in balance, in petroleum requirements.

New production records were set during 1952 when crude oil production totalled 58,915,723 barrels and the year's yield of natural gas was 95,697, 432 mscf.

Larger shares of crude oil production were borne by the Leduc-Woodbend field which produced 17,845,212 barrels and the Redwater field whose production totalled 23,965,842 barrels. The Turner Valley field was the largest natural gas producer with a production of 32,069,085 mscf.

At the end of January 1953, there were 3,378 oil wells in the Province and 138 drilling rigs were operating. During 1952, there were 946 new oil discoveries and 38 of natural gas. Estimated crude oil reserves now stand unofficially at between 1,250,000,000 and 1,500,000,000 barrels. Among the fields with large proven reserves are Redwater, whose estimated reserves are as high as 750,000,000 barrels, Leduc-Woodbend with more than 275,000-000 barrels and Wizard Lake which has been estimated to contain a reserve of more than 100,000,-000 barrels.

Finding new markets for Alberta oil has involved the building of expensive pipelines over great distances. The Interprovincial Pipeline, completed in 1950, extends 1,129 miles from Redwater to the head of the lakes at Superior, Wisconsin, and provides a terminal from which cheap lake transport can be utilized to take the oil the rest of the way to the southern Ontario market.

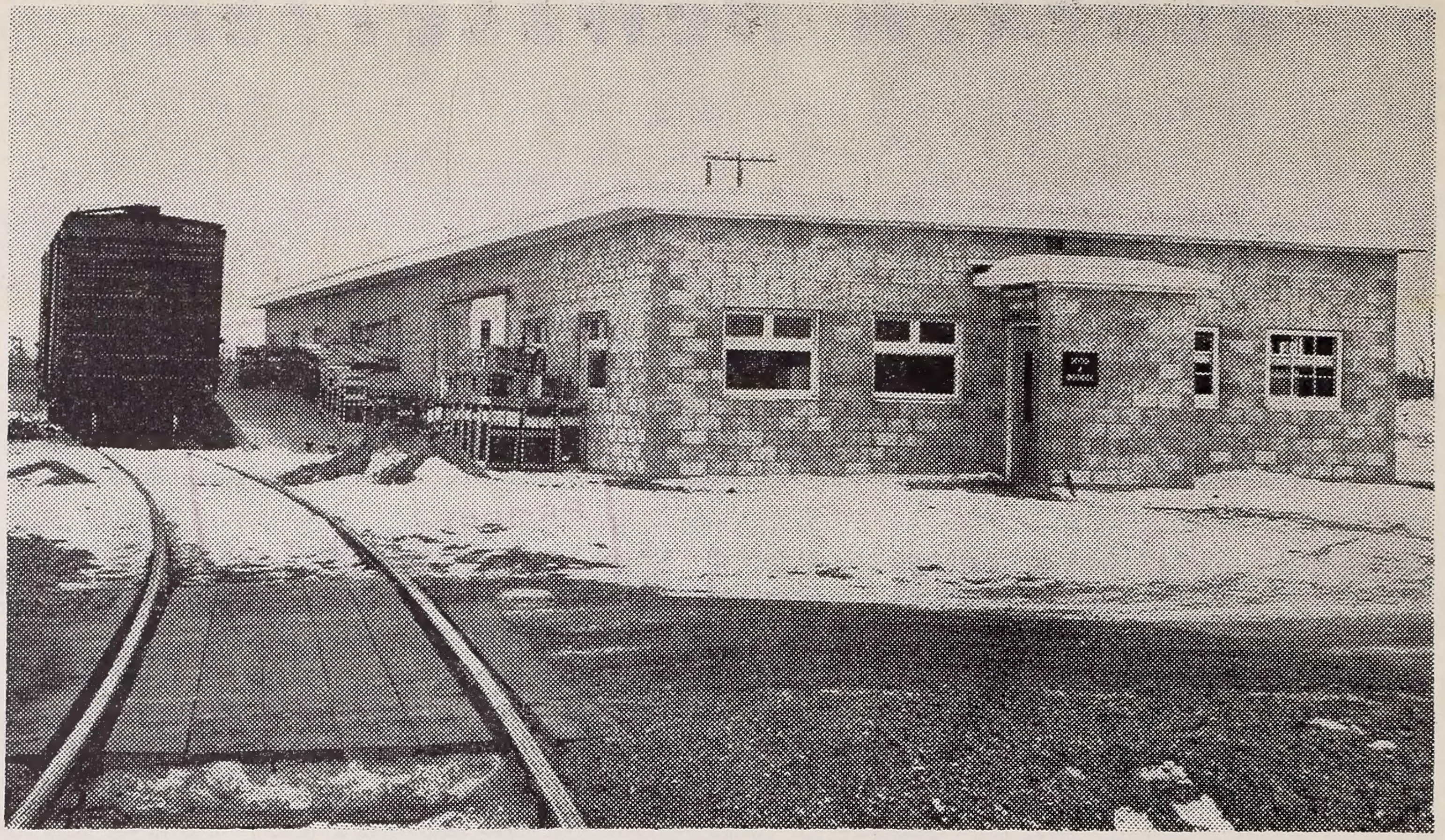
Initial capacity of the pipeline was 95,000 barrels a day out of Edmonton and 70,000 barrels a day maximum lakehead delivery capacity. However the seasonal nature of lake navigattion and similar seasonal fluctuations in western Canada's demand for crude created supply problems and it was decided to loop sections of the line and build additional pumping stations. This will raise the flow out of Edmonton to 140,000 barrels a day and the Superior terminal capacity to 95,000 barrels per day. Meanwhile, plans are well advanced to connect the Superior terminal with Sarnia by 625 miles of pipeline with an ultimate capacity of 300,000 barrels per day. Present plans anticipate a flow out of Superior to Sarnia of 84,000 barrels per day, which, with the market provided with a refinery at Superior, will dispose of 100,000 barrels of oil daily.

Completion of another western pipeline is expected this year. The Trans-Mountain pipeline, extending 711 miles from Edmonton to Vancouver, British Columbia, will have a potential capacity of 2000,000 barrels a day and will be able to serve not only Canada's West Coast but also American markets along the Pacific coast.

The purpose of the ALBERTA NEWSLETTER is to provide up-to-date information about development and opportunities in Alberta.

In this issue:

Polythene From Petroleum.
Survey of Cardston.
Pioneer Electric Plant.
Oil Development.



The Pioneer Electric Plant (*Alberta Government Photograph*)

ALBERTA INDUSTRIES

Pioneer Electric Alberta Limited

Red Deer's favorable industrial outlook and central geographical location were major influences in the choice of that city as a site for Pioneer Electric Alberta Limited, one of Alberta's newest plants.

Pioneer Electric Alberta Limited was formed to produce standard distribution, rural and small power transformers for Alberta utilities. Its formation resulted from the fusion of two ambitions—the ambition of a Nova Scotia electrical engineer to start in business n Alberta and the ambition of a Winnipeg transformer manufacturer to set up a plant west of Winnipeg.

E. A. Dillon, now the general manager of the Red Deer plant, was attracted by the industrial future of western Canada and set his sights on a transformer manufacturing company. Pioneer Electric Limited, of Winnipeg, formed shortly after the Second Great War by three men who saw the West's possibilities, had an ambition to expand westward, but was seeking an experienced engineer who could take charge of its projected plant.

When the two ambitions converged, the Winnipeg company found the management it was looking for in Mr. Dillon while the engineer found the company with the knowledge and experience which would make his ambition of a new plant in Alberta possible. Pioneer Electric Alberta Limited was formed and incorporated as an Alberta company, with Pioneer Electric Limited of Winnipeg holding the majority of the new company's shares.

Red Deer was selected as a site because it was "neutral" territory in the centre of the area in which the Company's major customers would be Calgary Power Ltd., Canadian Utilities Ltd., and Northland Utilities. As a smaller city, Red Deer also had a good environment for small industry, i.e. good industrial relations, a co-operative community, etc.

The requirements for the plant's specific location were complete. At 5727 - 53A Ave., it found a site which was within the city limits, had telephone and power lines to the site, sewage and natural gas lines nearby, and was very close to both road and rail transportation facilities. No. 2 Highway, the main highway from Calgary to Edmonton, was only three blocks from the site while a spur line on the C.P.R. could be built to the plant easily.

Pioneer Electric Alberta Limited opened for business early this year to serve the transformer needs of Alberta as well as parts of British Columbia. Ten employees, all Albertans except a British immigrant, work in the neat concrete-block building which houses the plant and offices. The sales representative is R. L. Brews and Son Ltd. of Calgary and Edmonton.

Transformers built at present are to the proven designs of Pioneer Electric in Winnipeg but eventually the Alberta plant will design its own transformers, following its policy of turning out an all-Alberta product.

Sales of transformers so far have been encouraging and the company hopes to have a good year. Pioneer Electric Alberta Limited, by following the pioneering philosophy of its associated Winnipeg company, has taken advantage of Alberta's expanding electrification and is making it possible for Alberta utilities to obtain transformers at lower prices than previously.

POLYTHENE FROM PETROLEUM

By J. D. Wright, Canadian Industries Limited; abstract of paper presented to annual western meeting, Canadian Institute of Mining and Metallurgy.

The Canadian petrochemical industry had its beginning in Sarnia during the last war with the production of synthetic rubber. New plants have been going up since then to make other petrochemicals and further new construction and expansion have been proceeding until at the present time it is estimated that in the neighborhood of $100,000,000 worth of construction is in progress.

As a typical petrochemical industry the production of polythene, which is the name generally given to polythene plastic, requires a relatively large capital investment. The Canadian Industries Limited plant now being erected a mile or so east of Edmonton will cost an estimated $13,000,000. A decision to make this investment in a plant covering some 30 acres requires a reasonably assured market, an adequate source of raw material and, of course, an economical process.

As far as market is concerned, the many and growing applications which result from polythene's unique combination of properties have resulted until recently in a continuous shortage of supply. With active sales development it appears that the proposed plant will be required to operate at capacity.

The raw material requirement for the expected polythene demand is estimated to be of the order of 13,000 tons of ethylene per year. Ethylene can be obtained from all of the petroleum hydrocarbons whether liquid or gaseous, and is present in virtually all oil refining off-gases. However, to the petroleum refiner ethylene is merely a by-product, generally of substantially lesser value than liquid hydrocarbons, and consequently the operation will normally be directed towards the maximum production of gasolines. Consideration was given to refinery gases as a source of ethylene because of the location of oil refineries in eastern Canada near the polythene market, but there was no guarantee of continuity of supply beyond a very short period of years. Thus it developed that the advantages of manufacture in eastern Canada close to the market were outweighed by the advantages of location in Alberta where the additional freight charges could be offset by a virtually unlimited supply of raw material at lower cost and with noticeably lower fuel costs as well.

The actual choice of the plant site near Edmonton was determined by the peculiarly appropriate composition of the gas available from the Leduc-Woodbend field, the prospect of further development of that field as a major producer, and the proximity of a city with its advantages of labour supply, housing facilities and railway.

Wet gas from the Leduc-Woodbend field is treated at Imperial Oil Limited's conservation plant at Devon, about 20 miles south of Edmonton. From this plant a dry gas is delivered at pipe line to the city of Edmonton for use as fuel.

Before the actual polythene process can begin, ethylene of high purity must be prepared from the raw material gas stream. A suitable method of ethylene production was worked out in consultation with the Lummus Company of New York and this company was retained to carry out the detailed design.

In brief, feed gas will be piped from the Devon to Edmonton pipe line through a metering station to CIL's ethylene plant. Here the ethane content will be absorbed by a stream of liquid hydrocarbons, called a sponge oil. After separation from the unabsorbed gas the sponge oil will be stripped of its ethane content and recycled. The ethane will be cracked in radiantly heated alloy steel tubes and the resultant ethylene separated by fractional distillation, purified, dried, liquified and stored at about 550 pounds per square inch pressure.

The hydrogen produced, together with some of the remaining gaseous hydrocarbons, will be used for fuel, the balance of the hydrocarbons being metered and returned to the utility company which operates the Devon-Edmonton pipe line. The ethylene produced by this process will be 99.85 per cent pure.

At the Edmonton plant, operations will require about 10,000,000 cubic feet of natural gas, 8,000,000 gallons of water and 35,000 kilowatt-hours of electricity a day. More than 200 persons will be employed, the majority being recruited from the Edmonton district.

Ethane will be separated from the natural gas stream and cracked to ethylene, the various processes and equipment used being similar to those used in the petroleum industry. In fact the ethylene plant will resemble part of a petroleum refinery in appearance. Pure ethylene gas at a pressure of 550 pounds per square inch will be piped to the compressor room of the polythene plant. Here it will be compressed to more than 20,000 pounds per square inch by machines of over 600 horsepower each and fed into the reaction vessels.

At this pressure, in the presence of traces of oxygen and at temperatures of the order of 200 deg. C., some of the ethylene will polymerize to form liquid polythene. The liquid polythene will be removed from the reactor continuously, and after being separated from any unpolymerized ethylene will be solidified by cooling and cut into cubes approximately ⅛-inch to the side. The unconverted ethylene will be recompressed and recycled to the reactor.

The flake polythene, which is the name generally given to the white cubes formed as described above, will be transported to the storage and packing building for packing into 50-pound bags in readiness for shipping.

From a brief outline, the polythene process may appear relatively simple and as far as its chemistry is concerned this is so. It is merely a matter of squeezing a lot of ethylene molecules so hard that they hook up like links in a chain into long formations consisting of perhaps 1,000 links. Indeed the structure of the polythene molecule is believed to be chainlike. In the solid polythene, adjacent molecules become cross-linked and somewhat more complicated and the result is the flexibility and toughness characteristic of this plastic. When drawn out into filaments or thin sheets, the individual molecules remain twisted or matted together like fibres in a cotton thread or in a sheet of paper and give high tensile strength.

It is in the need for close control of the temperature and pressure conditions in the reactor that difficulties arise, and extensive use must be made of the most modern developments in the field of instrumentation. Mechanical, pneumatic and electronic devices will control the various conditions as well as indicate and record them on graphic instrument panels. In addition the high pressure will require provision of elaborate safety devices for relief of sudden upswings.

Compressors, pipe lines, valves and other equipment must be of extremely massive construction yet fitted together with high precision, since at the pressures encountered even a slight leak cannot be tolerated.

Maintenance of this equipment will present interesting problems and it is quite possible that the maintenance staff will outnumber the operating staff. Large, modern shops will be located at the plant site. Gas-fired boilers will provide process and heating steam and there will, of course, be the usual personnel facilities and administrative officers.

No manufacture of industrial products or consumer goods at the Edmonton plant is contemplated. Flake polythene of various grades and colours will be produced and shipped to converters, who will make film, tubing, moulded products or other forms.

As a consequence of the substantially saturated hydrocarbon nature of its molecule, polythene is inert to most chemicals at room temperature. It is also almost completely insoluble at room temperature in all organic solvents, though some softening or embrittlement may occur. Hydrofluoric acid, which attacks glass and heretofore had to be kept in hard rubber or paraffin, can now be stored in polythene containers. Fibre drums with polythene liners are suitable containers for flaked caustic soda instead of the more usual steel drums.

As well as being used as an unsupported film, polythene can be used as a coating for paper to impart additional properties. It can be hot melt coated, applied in a suitable solvent or mixed with various waxes for hot melt coating.

Another application based on polythene's resistance to corrosion and freezing temperatures is in the production of pipe. For cold water service, particularly out-of-doors and in acid or alkaline soils polythene has advantages over metals. It is available in the usual pipe sizes up to four inches and in 100-foot lengths. It is, of course, much lighter than iron pipe of comparable size, is undamaged by corrosion or frost, is flexible and has fewer joints. The cost of 2-inch pipe is about the same as standard iron pipe, but polythene is more expensive in the smaller sizes and less expensive in the larger. It can be butt welded or threaded and used with metallic couplings, which can then be wrapped with polythene adhesive tape if necessary.

Polythene sheet is available in various thicknesses up to 1¼ in. Tanks can be lined and larger articles can be fabricated from welded sheet. A special torch is used and the welding actually accomplished by directing a stream of hot, inert gas, e.g., nitrogen at 200 deg. C., on to the weld. Polythene welding rod is used.

Much development work needs yet to be done on the engineering aspects of the equipment, as well as on the market for the product. It was, however, a happy coincidence that the process had reached its present state at a time when Canada's petroleum resources were expanding at their present phenomenal rate.

As to the future, there can be no doubt that the petroleum and petrochemical industries will continue their enviable record of achievement. It is hoped that polythene from Canadian petroleum will make a worth while contribution to this record.

CARDSTON

LOCATION: Cardston is situated on Lee's Creek, at the junction of Highways 2, 5 and 40, 46 miles southwest of Lethbridge and 15 miles north of the International Border. It is on the Lethbridge-Glenwood branch of the Canadian Pacific Railway.

ALTITUDE: 3,775 feet.

TEMPERATURE: Average summer 55°; average winter 29°; average annual 40°.

RAINFALL: Average annual rainfall, 13.31 inches; average annual snowfall, 67 inches; average annual precipitation, 20.01 inches. (These averages cover a 35-year period.)

GEOLOGY: The bedrock underlying the glacial drift at Cardston is of the Willow Creek formation of Lower Tertiary Age. The beds are composed of soft shale and sandstone which weather into outcrops of the badlands type. The Willow Creek formation may be distinguished by its brilliant color banding.

SOIL: Cardston lies in a shallow black soil zone. The upper three to six inches are black soil, with dark brown underneath and the lime horizon at depths of 24 to 30 inches.

The soil is fairly well supplied with nitrogen and organic matter. Wheat is the principal crop grown, but considerably more diversification is possible. The non-arable land is generally very good pasture.

This is grassland territory where bluffs of trees are found in places where moisture conditions are more favorable.

HISTORY: Cardston takes its name from its founder, Charles Ora Card, the leader of a group of Mormons seeking a new home on Canadian soil. Card's first visit to site of the town was in October, 1886, and squatter's rights were established the following May. On June 3, 1887, the main company of Mormon emigrants arrived, and the land was surveyed for homesteads.

The first structure erected at Cardston was a "bowery" church. From this beginning the settlement grew on a co-operative basis, with store, cheese factory, saw mill, and flour mill operated co-operatively for the needs of the people.

Cardston became a village on December 29, 1898, and incorporated as a town July 2, 1901, with Charles Ora Card as the first mayor.

The first newspaper, "The Cardston Record", was started in 1895. In 1898, the first Alberta oil boom began in the Cardston area and in the same year, work began on the irrigation canal head works near Cardston. Just after the turn of the century, water from St. Mary's River was being spread over the farms in Magrath, Raymond and Stirling districts. In 1904, a narrow gauge railway connected Cardston with Lethbridge. By 1907 the town owned its own waterworks and electric light plant, and in 1910 a small sewerage plant was installed.

Education in Cardston began almost with the arrival of the new settlers. Classes were held in a log cabin home until the new meeting house was finished in January, 1888. Cardston School District Number 457 was erected September 30, 1897. It was included in St. Mary's School Division January 1, 1946.

The Mormon temple, completed in 1923, is the only one of its kind in Canada. It took 10 years to build and cost $1,000,000. This magnificent temple has made Cardston famous as the "Temple City".

LIVING CONDITIONS: Cardston lies at the crossroads to three National Parks—Waterton, 24 miles west, Banff 259 miles northwest, and Glacier National Park, Montana, 28 miles southwest. Lee's Creek supplies the town with water. The banks of the creek are lined with trees and there are many tree-sheltered homes in the town. West of Cardston the land rolls towards the foothills; to the east is flat prairie. There are game fish such as trout in the surrounding streams and mountain lakes, and pike and whitefish in the prairie lakes. Upland game birds—ducks, geese and pheasants are plentiful. Deer, elk and various species of bear provide good hunting 25 miles west of town.

Cardston lies in the chinook belt and often experiences the warm winds which raise winter temperatures 50 degrees in a few hours.

Cardston is fundamentally a Mormon settlement.

POPULATION: 2,490.

ADMINISTRATION: The town is governed by a mayor and six councillors. The mayor is elected for a two-year term, and the councillors for three-year terms. The Secretary-Treasurer administers the town's affairs in accordance with policies set by the council.

FIRE PROTECTION: There is a 17-man volunteer fire brigade, which works with modern equipment.

TAX STRUCTURE: The 1952 mill rate was 50 mills, made up of 38 school; 4.5 municipal; 6 hospital; .7 library; and .8 cemetery.

LAW ENFORCEMENT: Two town constables, a police magistrate and a justice of the peace are responsible for law enforcement in Cardston. There is also a detachment of R.C.M.P.

AREAS: The town has an area of 1,095 acres, of which 244.96 acres are streets and lanes and 18 are parks and playgrounds.

POWER: Three-phase 60 cycle power is supplied by Calgary Power Ltd. Power rates are five cents per kilowatt hour for the first 300 kilowatt hours used per month, 3½ cents per kilowatt hour for the next 300 kilowatt hours and 1⅔ cents per kilowatt hour for all over 600 kilowatt hours.

WATER: Water is obtained from a dam four miles upstream on Lee's Creek. It flows by gravity to the town through a 14-inch wood stave pipe and is stored in a 4½ million gallon storage reservoir. There is a 500 gallons per minute electric pump for emergency purposes, and a purification plant is contemplated for 1953. Domestic water rates are a flat $1.75 to $2.50 per month and commercial rates are $2.50 to $25 per month. There are no water meters.

FUEL: Propane gas is available at $7.50 per 100-pound cylinder and diesel fuel sells from 18 to 20 cents per gallon depending on the grade. Bituminous coal is obtained from the mines at Lethbridge. The calorific value is around 11,000 B.T.U. per pound and the prices per ton range from $10 to $14, depending on the size.

RESOURCES: Wheat and coarse grains, straw, horses, cattle, sheep and hogs, dairy products and poultry products, honey, common sand and gravel.

HEALTH SERVICES: The Cardston Municipal Hospital (District No. Five) has 28 beds and nine bassinets. The staff consists of seven graduate nurses and six ward aides. The "$1-a-day" hospitalization plan is in effect in Cardston, and the Cardston Health Society operates a prepaid health service. Three doctors look after the members, who pay $35 per year for a family of any size. The service includes free medical, surgical and obstetrical service, but does not include specialist services. It does however, include advice regarding specialists' prospective work.

An Indian Hospital, operated by the Roman Catholic Order of Grey Nuns is under supervision of the Federal Department of Indian Affairs. There are 40 beds and five bassinets.

TRANSPORTATION: Canadian Pacific Railway operates one train each way every other day except Sundays, between Lethbridge and Glenwood via Cardston. Greyhound Bus Lines run two buses each way daily between Lethbridge and Cardston, and there is daily trucking service to Lethbridge and Calgary. There is one taxi stand with one cab. Cardston is at the junction of Highway 2, hard-surfaced from the United States to Northern Alberta, Highway 5, hard surfaced from Lethbridge to Waterton, and a gravel highway, No. 40, across the border to Browning, Montana.

COMMUNICATIONS: Alberta Government Telephones, Canadian Pacific Telegraph, Dominion Post Office, Lethbridge Radio Station CJOC and The Cardston News, a weekly newspaper with a circulation of 998.

FINANCIAL FACILITIES: The Bank of Toronto, the Royal Bank of Canada and a Provincial Treasury Branch.

HOTELS AND TOURIST CAMPS: There are two hotels with a total of 78 rooms from $2 up. Four auto courts, with 29 units rent from $3.50 to $9 per night.

LODGES AND SERVICE CLUBS: Masonic, Rotary Club, Lions, Chamber of Commerce, Junior Chamber of Commerce, Canadian Legion, and the Latter Day Saints' Church (Alberta Stake).

EDUCATION: The five town schools constitute Cardston School District number 457. The high school has a large auditorium, workshop and class rooms for home economics. A $100,000 junior high school is now being added. These schools have 870 students and 33 teachers.

St. Mary's School Division headquarters are located at Cardston. The division has a secretary-treasurer, a superintendent who is also school inspector and acts in an advisory capacity to the school board, 110 teachers and 2700 students.

In addition to the regular courses in grades one to 12, there are classes in music, art, dramatics, commercial subjects, farm and home mechanics, woodwork, home economics, plant and animal science.

INDUSTRIAL DEVELOPMENT: Industrial sites adjacent to trackage are available. These sites can be served with all utilities. Cardston offers excellent opportunity for industrial development.

Cardston was built on a co-operative and sharing principle. A co-operative creamery was started in 1911, and now produces around 170,000 pounds of butter each year. There are five grain elevators, with a total storage capacity of 395,000 bushels. The town's development is supported by cattle and sheep ranching, mixed farming and the growing of grain. Cardston's trading area extends 16 miles north, 14 miles south, 18 miles east and 25 miles west, and consists of a population of 7,207 (1946 census).

FURTHER INFORMATION

More details on Cardston can be obtained from:

Secretary-Treasurer,
Town of Cardston,

or

Director of Industrial Development,
Department of Economic Affairs,
Legislative Building,
Edmonton.